Newton Divided Differences

1) Given a table of (x,y) pairs, input x values as: $x_0, x_1, x_2, x_3 \ldots x_n$, and input the y values and assign them to an f(x): $f(x_0), f(x_1), f(x_2) \ldots f(x_n)$ as $F_{0,0}, F_{1,0}, \ldots F_{n,0}$

2) Output the numbers $F_{0,0}, F_{1,1} \ldots F_{n,n}$ where the summation:

   a) $P(x) = \sum_{x=0}^{n} F_{i,i} \prod_{j=0}^{i-1} (x - x_j)$

3) Time for cycle:

   a) For $i = 1 < n$, i++

      (i) For $j = 1 < i$, j++

         (1) Set $F_{ij} = (F_{ij-1} - F_{i-1,j-1})/x_i - x_{i-j}$

   b) Output $(F_{00}, F_{11} \ldots, F_{nn})$; ($F_{ii}$ is $f[x_0, x_1 \ldots x_i]$)

4) Stop